ORIGINAL

ShawPittman LLP

March 10, 2004

Via Hand Delivery
Ms Marlene H Dortch
Secretary
Federal Communications Commission
445 12th Street, S W
Washington, D C 20554

Re: Mobile Satellite Ventures Subsidiary LLC
***Ex Parte* Presentation**
IB Docket No. 01-185
File No. SAT-MOD-20031118-00333 (ATC application)
File No. SAT-AMD-20031118-00332 (ATC application)
File No. SES-MOD-20031118-01879 (ATC application)
File No. SAT-AMD-20040209-00014 (replacement satellite application)

Dear Ms Dortch

On March 9, 2004, Lon Levin, Vice President of Mobile Satellite Ventures Subsidiary LLC ("MSV"), Peter Karabinis, Vice President and Chief Technical Officer of MSV, and Bruce Jacobs and David Konczal of Shaw Pittman LLP, counsel for MSV, met with the following members of the Office of Engineering and Technology ("OET"): Bruce Franca, Ira Keltz, Alan Scrime, and Ed Thomas MSV presented the information contained in the attached set of presentation materials

Please direct any questions regarding this matter to the undersigned.

Very truly yours,

David S Konczal

cc Bruce Franca
Ira Keltz
Alan Scrime
Ed Thomas

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MSV's Next Generation System

March 9, 2004

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Overview

- Benefits of MSV's proposed system
- System description
- Avoidance of in-band and out-of-band interference to other systems
- Key proposals to FCC

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Benefits of MSV's proposed system

- Spectrum efficiency
- Improved coverage and availability
- Improved service for public safety
- U.S. technology leadership
- Financial viability for satellite services

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System Description

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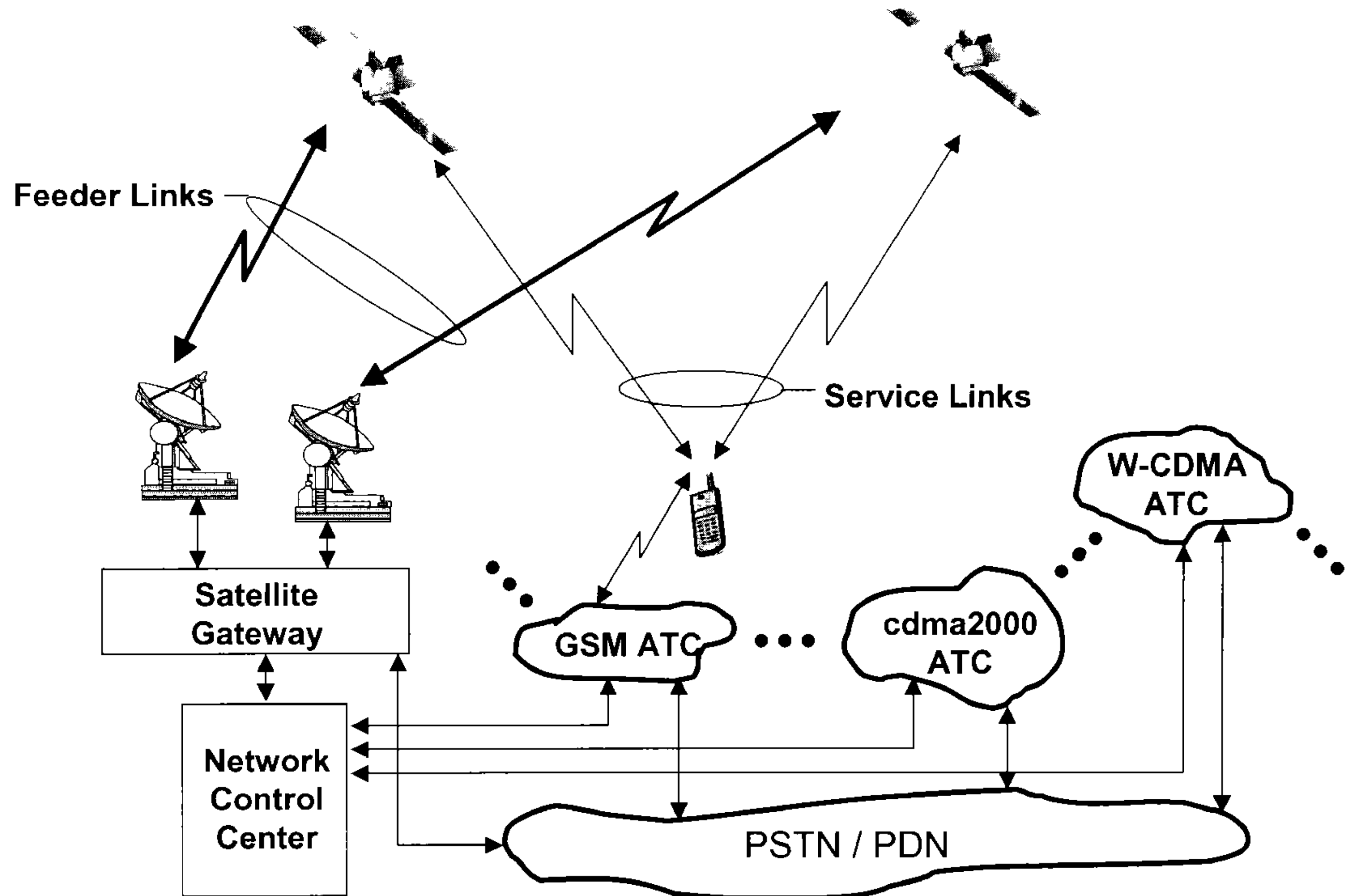
Architecture
Space-Based Network Integrated with ATC



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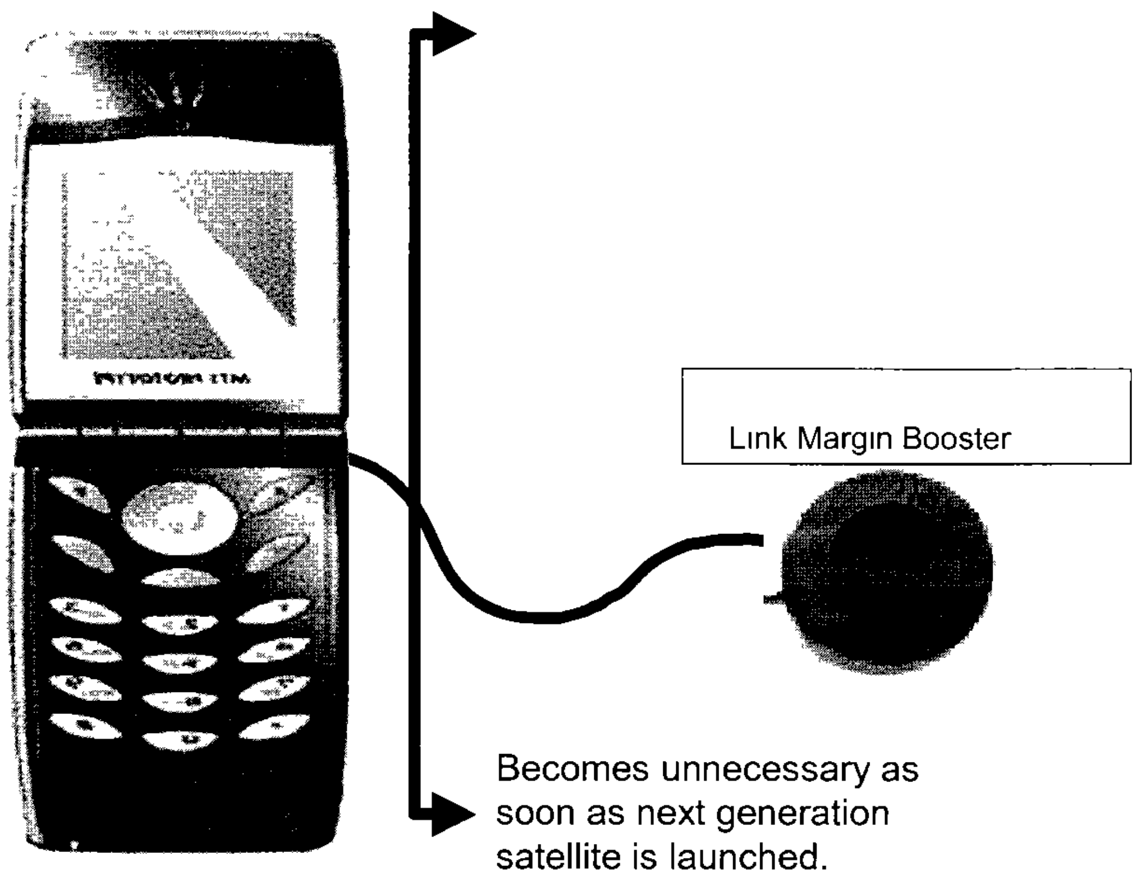
Integrated Satellite/ATC Terminal



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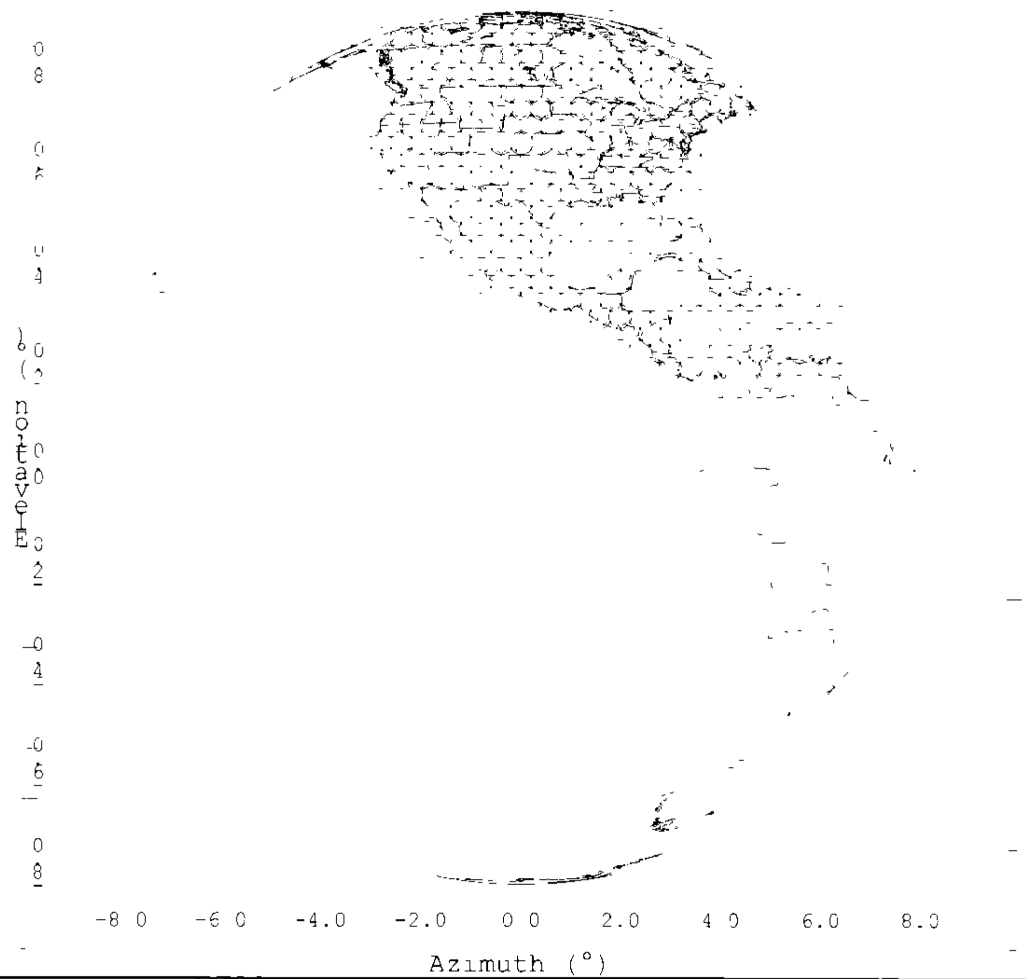
Satellite System Footprint Served By Next Generation Spot Beams



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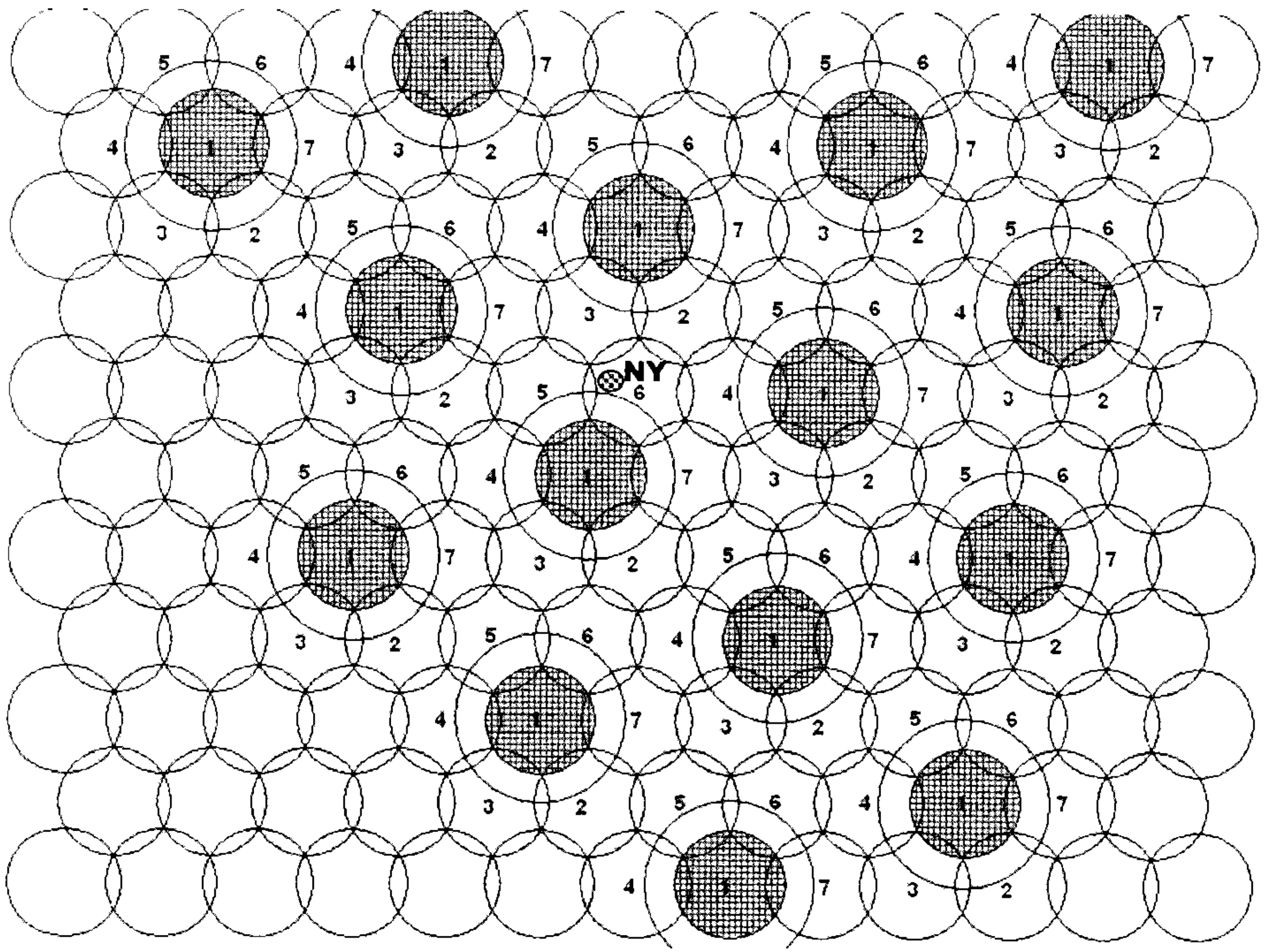
Illustrative Frequency Reuse Between Space Segment And ATC



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Avoidance of interference to other systems

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In-Band Emissions

- MSV terminal in both Satellite and ATC Modes

  EIRP = - 4 dBW for GSM, -13 dBW for CDMA
- These power output levels are so low that, based on the FCC's own interference analysis (including channel parameters, inter-system discrimination, and other interference mitigation mechanisms), almost 300,000 GSM users would be able to communicate systemwide on the same carrier (co-channel) using the ATC facilities without causing more than 0.25 dB degradation (6% $\Delta T/T$) to another co-channel satellite system such as Inmarsat that has coordinated its satellite spectrum with MSV.
- The co-channel impact to MSV's own satellite links would also be less than 0.25 dB (6% $\Delta T/T$), due to interference cancellation at MSV's satellite gateway.

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Out-of-Band Emissions

From ATC Terminals (Carrier ON)

- Into GPS/GLONASS Band (1559 to 1605 MHz):
  - Wide band emissions

    -90 dBW/MHz initially, improving to -95 dBW/MHz five years after MSV commences commercial operations
  - Narrow band emissions (bandwidth $\leq$ 700 Hz)

    -100 dBW initially, improving to -105 dBW five years after MSV commences commercial operations
- Into extended GPS/GLONASS Band (1605 to 1610 MHz)

  Limit is derived by linear interpolation between value specified at 1605 MHz and the following value at 1610 MHz:

  •Wide ban d emissions: -66 dBW/MHz initially, improving to -71 dBW/MHz five years after MSV commences commercial operations

  •Narro w band emissions: -76 dBW initially, improving to -81 dBW five years after MSV commences commercial operations

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Out-of-Band Emissions (con't)

From ATC Terminals (Carrier ON) (con't)

- Into Inmarsat Band:

  -43 dBW/MHz; potential impact to Inmarsat: 0.001% $\Delta T/T$

From ATC Terminals (Carrier OFF)

- ATC terminals in carrier OFF state will satisfy OOBE limits 10dB more stringent than the corresponding limits in carrier ON state (for both GPS & Inmarsat bands).

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Out-of-Band Emissions (con't)

From ATC Base Stations

- Into GPS/GLONASS Band (from 1559 to 1610 MHz):
  - Wide band emissions

    -100 dBW/MHz
  - Narrow band emissions

    -110 dBW (emission bandwidth $\leq$ 700 Hz)

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Out-of-Band Emissions (con't)

From ATC Base Stations (con't)

- Into Inmarsat Band
  - -101.9 dBW/Hz = -41.9 dBW/MHz (per sector independent of number of carriers)
- FCC's Conclusions on Potential Impact to Inmarsat

Inmarsat MET Type	ΔT/T Impact (%)
Land Mobile	7.2 (Table 2.2.1.2.A of ATC Order)
Airborne AMS(R)S	5.5* (Table 2.2.3.1.A of ATC Order)
Maritime GMDSS	6.7** (Table 2.2.2.2.A of ATC Order)

- ***Assumes fully-loaded mature ATC with 1000 base stations per city and airborne platform at minimum allowed altitude of 304 meters; zero dBi MET antenna gain in direction of base stations; zero dB polarization discrimination; free-space propagation. The FCC calculated 16.5% ΔT/T based on OOBE limit of -41.9 dBW/MHz/carrier with 3 carriers per sector.**
- ****The FCC calculated 20% ΔT/T based on OOBE limit of -41.9 dBW/MHz/carrier with 3 carriers per sector.**

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Proposals in MSV's ATC Application that Require Additional FCC Review

- In-Orbit Spare
- Co-Channel Reuse
- Base Station EIRP Limit
- Base Station PFD Limit
- Deviations Consistent with Baseline System
  - ATC Terminal Antenna Gain
  - 80% Deployment of Total ATC in United States
  - Unlimited Reuse of Non-Co-Channel Frequencies
  - Use of GSM, cdma2000, and/or W-CDMA
- Vocoder
- Peak Traffic Limit
- Base Station Overhead Gain Suppression

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In-Orbit Spare

Proposal

Permit MSV to use an in-orbit spare satellite rather than an on-ground spare. (MSV ATC Application at 8-9)

Rationale

- In the event of a failure or an anomaly, an in-orbit spare is able to restore service almost instantly, as MSV demonstrated recently. An on-ground spare would leave consumers without satellite service for months.
- The existing satellites are able to provide effective back-up to each other.

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Co-Channel Reuse

Proposal

Permit MSV to operate an ATC that when fully loaded might cause up to a 0.25 dB (6% $\Delta T/T$) rise in the noise floor of a co-channel system. (MSV ATC Application, Appendix I)

Rationale

This modest increase in what the FCC has permitted would be consistent with ITU recommendations and represents a negligible impact on Inmarsat.

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Base Station EIRP

Proposal

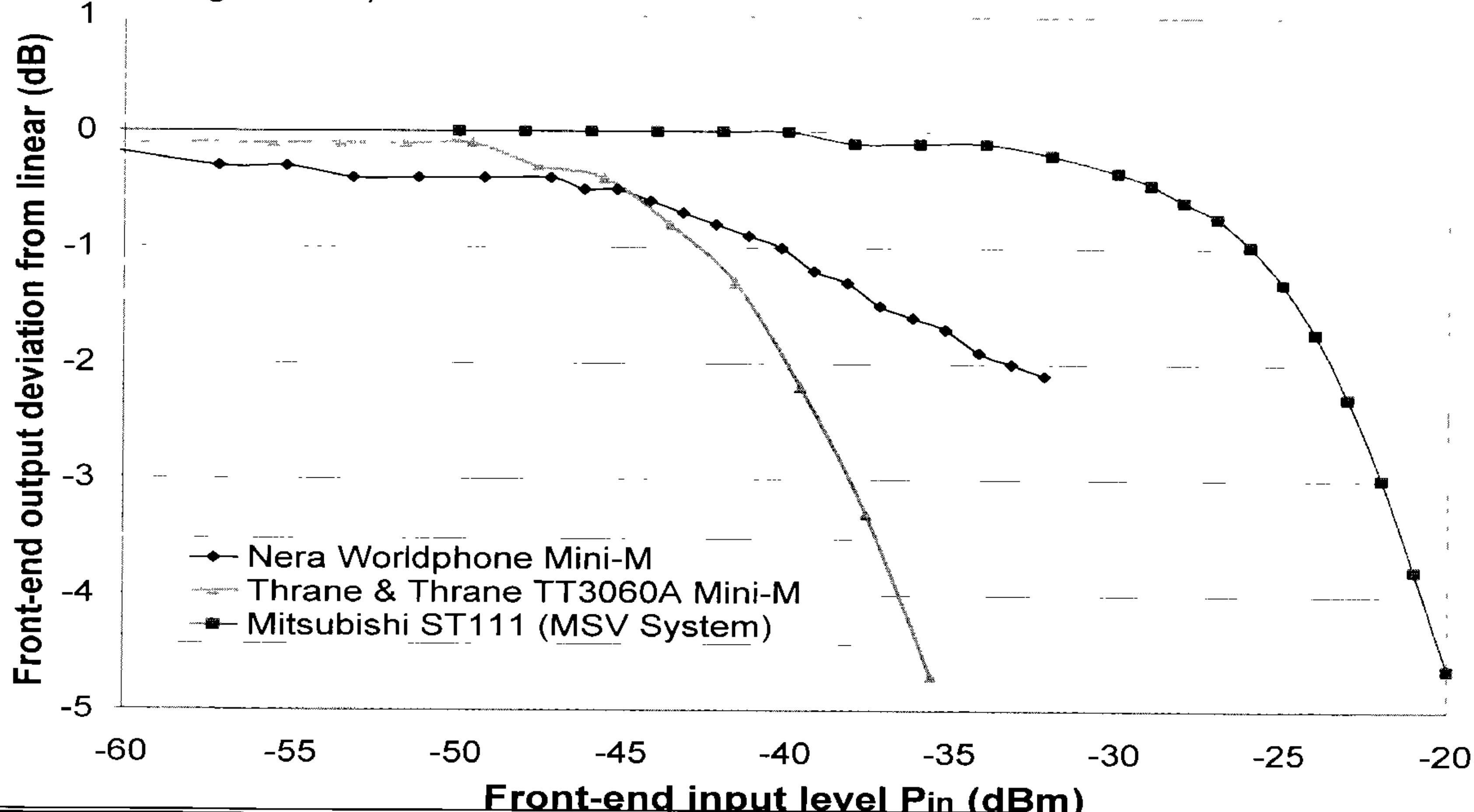
Permit MSV to increase the aggregate EIRP of each base station sector by 15 dB and remove the limit of 3 carriers per sector. (The existing limit is 19.1 dBW EIRP per carrier, or a total of 23.9 dBW EIRP per sector). (MSV ATC Application, Appendix J)

Rationale

- In setting the existing limit, the FCC assumed that land-mobile and maritime (GMDSS) Inmarsat METs overload at an interfering signal level of -60 dBm.
- MSV has conducted extensive measurements on both types of Inmarsat MET families and has found that the actual overload threshold is conservatively -45 dBm.
- MSV's own terminals overload at more than -30 dBm.

Base Station EIRP (con't) -- Representative Measurements of Two Mini-M METs and One MSV MET

(More measurements than the ones shown below have been conducted with corroborating results)



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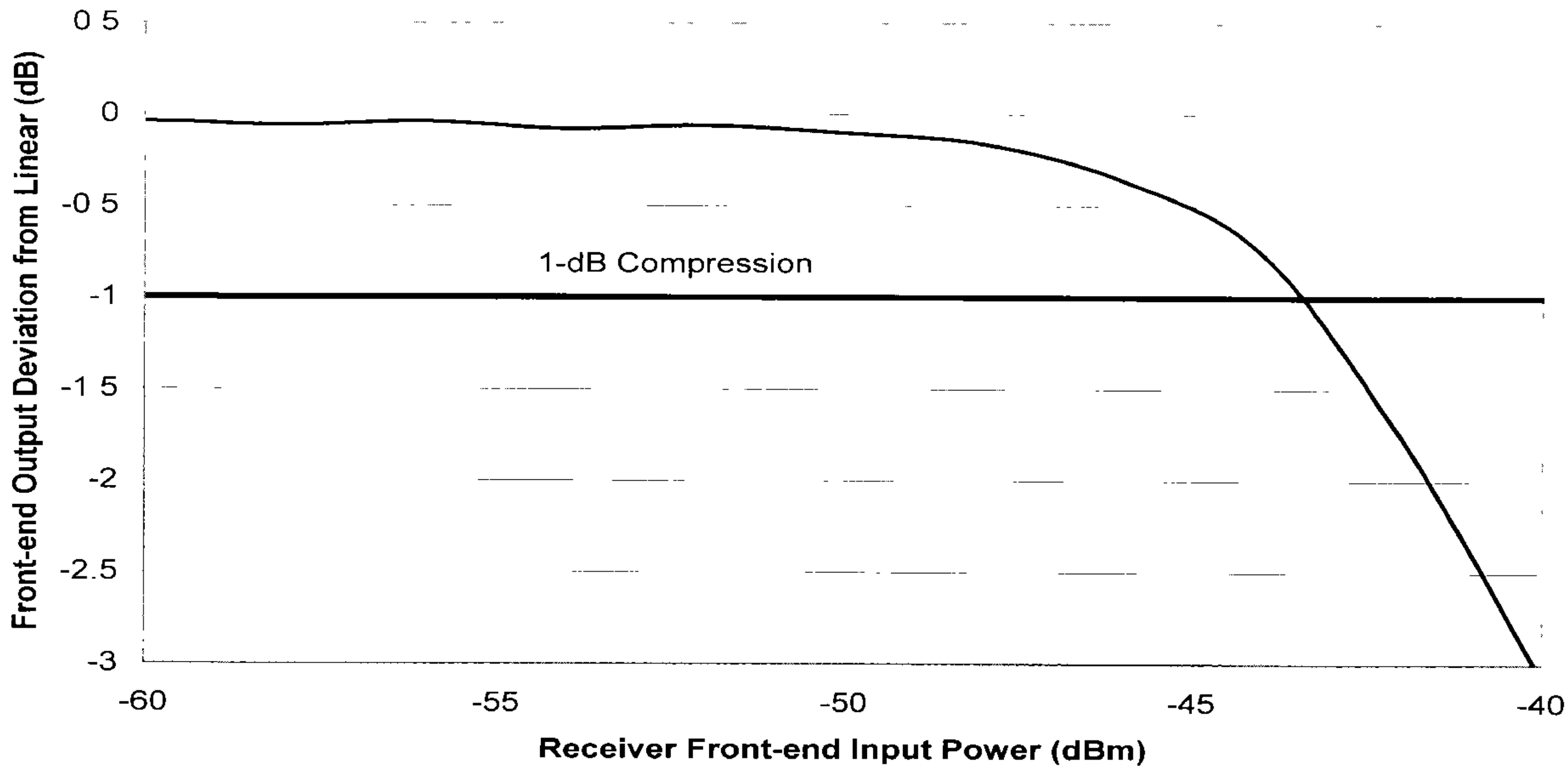
Base Station EIRP (con't) --
Measurements of Inmarsat-B GMDSS Maritime Terminal

Nera Saturn Bm Marine Terminal (Inmarsat-B)



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Base Station PFD Limit

Proposal

- Relax the PFD limit on ATC base stations near airports to an aggregate of -44.8 dBW/m^2/sector (-59.8 + 15). (MSV ATC Application, Appendix K)
- Relax the PFD limit on ATC base stations near navigable waterways to an aggregate of -49.6 dBW/m^2/sector (-64.6 + 15). (MSV ATC Application, Appendix K)

Rationale

As discussed above, the FCC has overstated the overload level of Inmarsat land-mobile and maritime METs by 15 dB and has thus unnecessarily restricted the PFD limit of L-band ATC base stations near airports and navigable waterways.

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Deviations Consistent with Baseline System

Proposal

Permit MSV to operate a system that is consistent with the baseline system, as follows:

1. **ATC terminal antenna gain of -4 dBi, rather than 0 dBi as assumed by the FCC (see slides 23-25). (MSV ATC Application, Appendix H)**
2. **80% deployment of total ATC in the United States, rather than the 50% US deployment assumed by the FCC.**
3. **Unlimited use of coordinated frequencies that are not co-channel with any visible L-band satellites (see slide 26). (MSV ATC Application, Appendix G)**
4. **Use of GSM, and/or CDMA2000, and/or W-CDMA (see slide 27). (MSV ATC Application, Appendix B)**

Rationale

The proposed operations will permit MSV to increase spectrum efficiency and market appeal without increasing Inmarsat's noise floor above levels permitted in the FCC's initial order.

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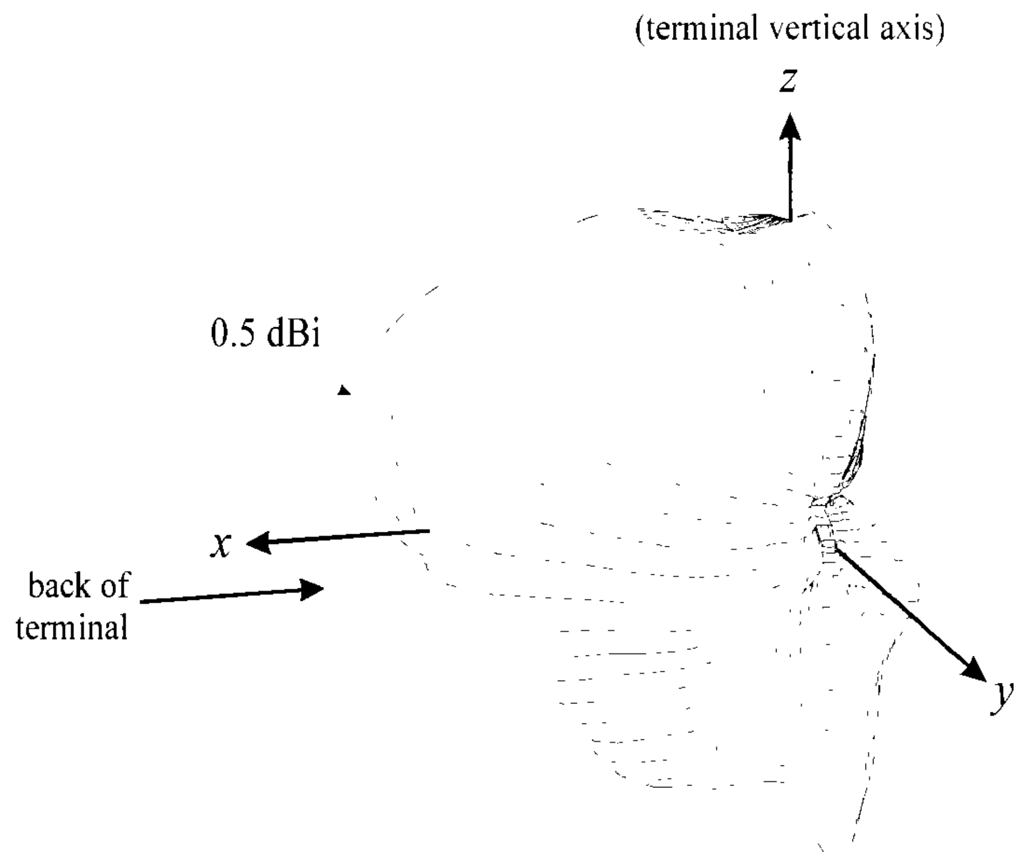
Deviations from Baseline (con't) -- ATC Terminal Antenna Gain

3-D Model of MSV's Next Generation Satellite/ATC Terminal Antenna Element (Patch Antenna) (Derived from measured data provided to MSV by Ericsson)



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Deviations from Baseline (con't) -- ATC Terminal Antenna Gain

Average ATC Terminal EIRP toward a Satellite for Random Terminal Orientation (0 dBW into terminal antenna port)

Antenna Type	Avg. EIRP Toward Satellite
Internal Patch	-4.5 dBW
External Stubby	-4.7 dBW

Average EIRP (dBW) Toward a Satellite of a Terminal that is Oriented next to a User's Ear with Internal Patch Antenna (0 dBW into terminal antenna port)

		Elevation Angle to Satellite (measured from horizon - degrees)				
		25	30	35	40	45
ATC Terminal Tilt Angle from Vertical (degrees)	30	-5 2	-5 3	-5 5	-5 7	-5 9
	40	-5 1	-5 2	-5 4	-5 6	-5 9
	50	-5 1	-5 3	-5 5	-5 7	-6.1
	60	-5 1	-5 3	-5 7	-6 0	-6 5
	70	-5 2	-5 5	-5 9	-6 4	-6 9

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Deviations from Baseline (con't) --
ATC Terminal Antenna Gain

Average EIRP (dBW) Toward a Satellite of a Terminal that is Oriented next to a User's Ear with External Stubby Antenna (0 dBW into terminal antenna port)

		Elevation Angle to Satellite (measured from horizon - degrees)				
		25	30	35	40	45
ATC Terminal Tilt Angle from Vertical (degrees)	30	-5.6	-6.1	-6.8	-7.4	-8.2
	40	-6.1	-6.6	-7.0	-7.5	-8.0
	50	-6.6	-6.9	-7.1	-7.3	-7.6
	60	-6.9	-6.9	-6.9	-7.2	-7.7
	70	-6.7	-6.7	-7.0	-7.4	-7.7

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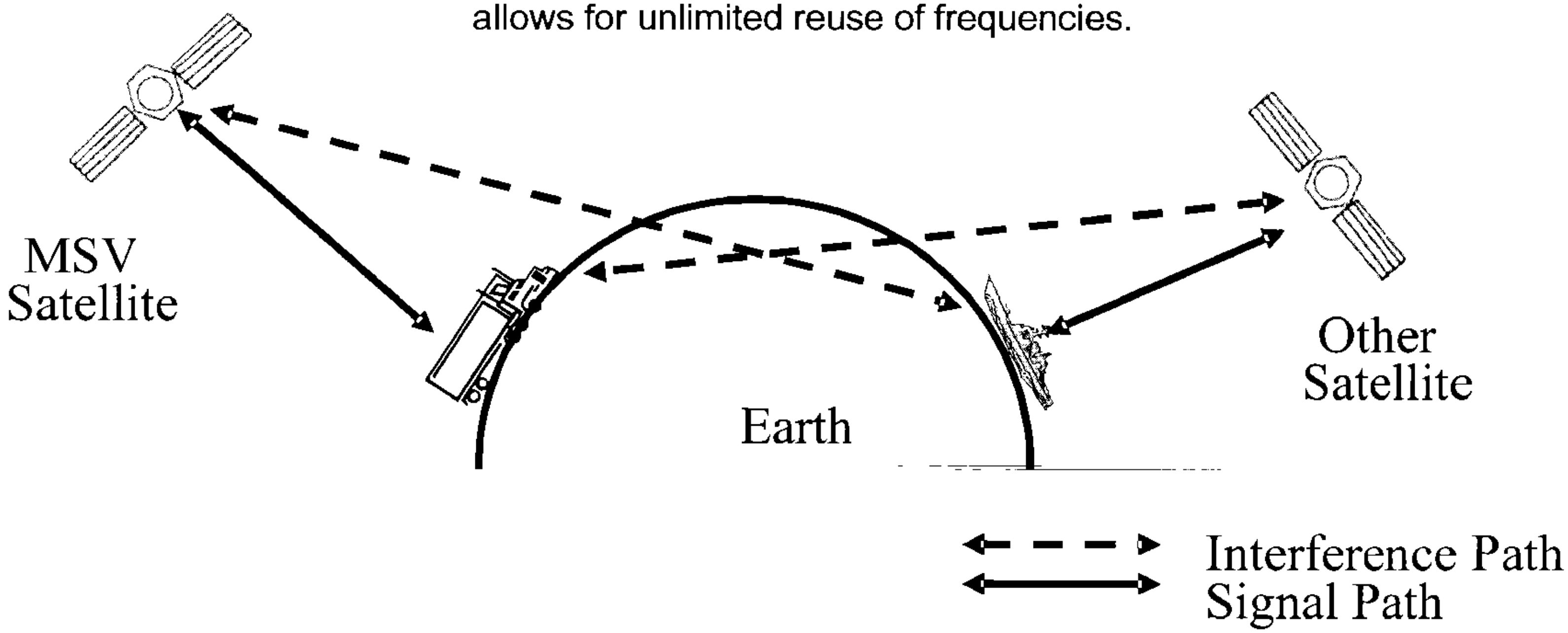
Deviations from Baseline (con't) -- Non Co-Channel Frequencies

Satellites Widely Separated with Interference Paths Blocked by Earth's Curvature

The signal blockage mechanism illustrated below precludes inter-system interference and allows for unlimited reuse of frequencies.



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Deviations from Baseline (con't) -- ATC Based on GSM, cdma2000, and W-CDMA

- For an ATC that is based on all three technologies (GSM, cdma2000, and W-CDMA) the following constraint equation specifies the allowed distribution of on-the-air traffic associated with the three standards.
- $N/8 + M/50 + L/200 = R$,

  where N denotes the number of GSM time slots (channels) supported ATC-wide by a given GSM carrier as that carrier is used and reused by the ATC, M represents the number of cdma2000 co-channel codes (channels) supported by a single cdma2000 carrier as that carrier is used and reused throughout the ATC, L identifies the number of W-CDMA co-channel codes (channels) on a single W-CDMA carrier as that carrier is used and reused by the ATC, and R denotes the authorized GSM-based ATC frequency reuse.
- The above equation states that, from a co-channel interference standpoint, 8 co-channel GSM users equate to 50 cdma2000 users or 200 W-CDMA users.

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Vocoders

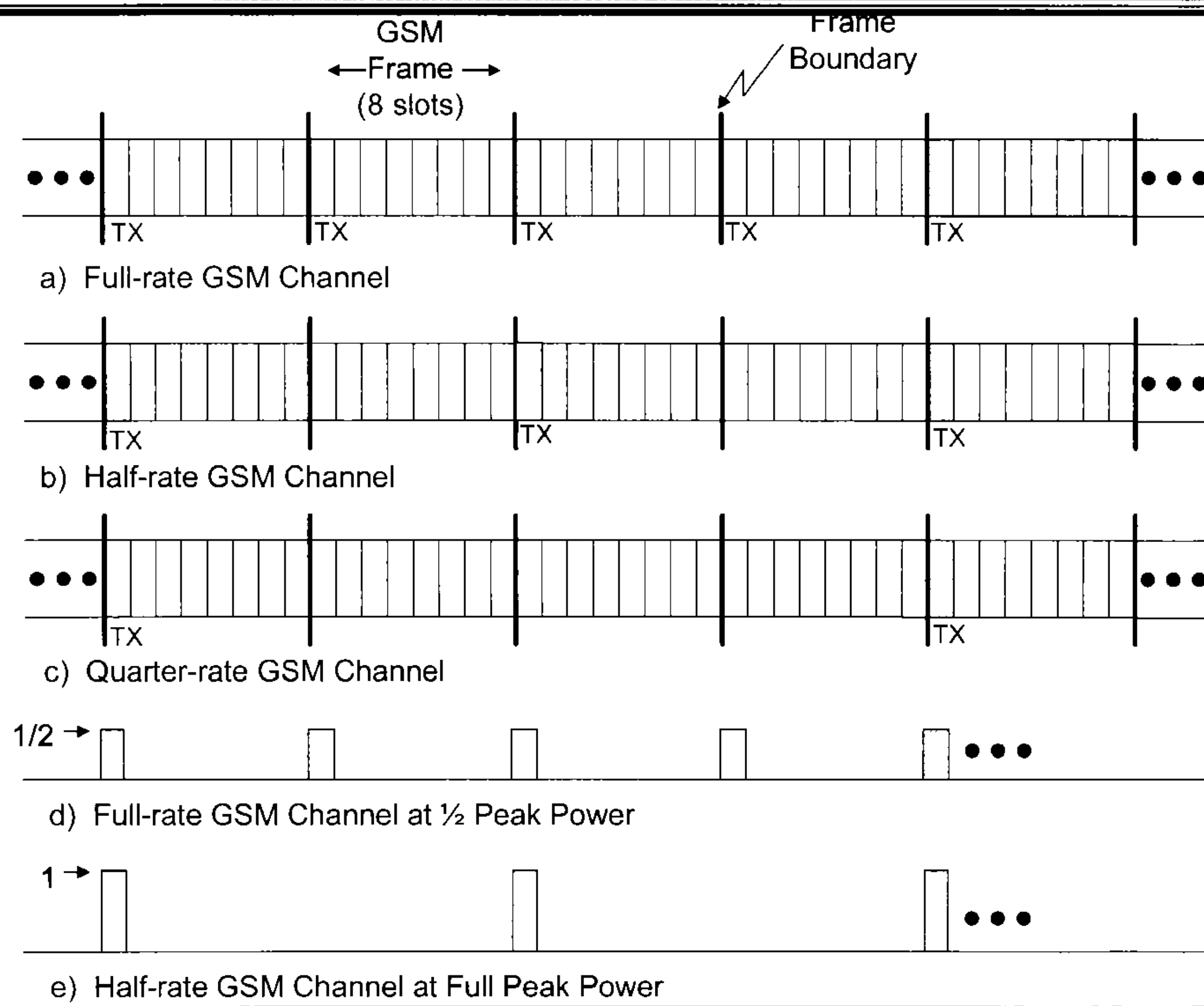
Proposal

Attribute to "half-rate" vocoder in ATC mobile terminals the same 3.5 dB reduction in average interference attributed to quarter-rate vocoders in the ATC Order. (MSV ATC Application, Appendix C)

Rationale

In GSM, a half-rate vocoder operates at 4.75 kbps and a full-rate vocoder operates at 13 kbps. Switching a terminal from full-rate to half-rate provides $10\log(13/4.75) \approx 4.4$ dB output power reduction. The following chart illustrates operation on full-rate, half-rate, and quarter-rate GSM channels.

Vocoders (con't) – GSM Channel Structures (Full-rate, Half-rate, and Quarter-rate)



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Peak Traffic Limit

Proposal

Remove the limit of no more than 90,000 ATC terminal carriers on the system at any one time.

Rationale

- The existing limit would protect Inmarsat satellites from out-of-channel emissions to a level of 0.001% $\Delta T/T$, far more protection than appropriate or necessary.
- A limit on co-channel interference of no more than 6% $\Delta T/T$ is sufficient to protect Inmarsat.

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Base Station Overhead Gain Suppression

Proposal

Relax the limit on base station overhead gain suppression by 10 dB. (MSV ATC Application, Appendix L)

Rationale

A 10 dB relaxation would permit MSV to build far more cost-effective base station transmitters while increasing the potential impact to airborne receivers by less than 0.03 dB.

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Base Station Overhead Gain Suppression (con't)

ATC Base Station Antenna Discrimination Limits as Set Forth in the *ATC Order*

Angle from Direction of Maximum Gain, in Vertical Plane, Above Antenna (Degrees)	Antenna Discrimination Pattern (dB)
0	Gmax
5	Not to Exceed Gmax – 5
10	Not to Exceed Gmax -19
15 to 30	Not to Exceed Gmax -27
30 to 55	Not to Exceed Gmax -35
55 to 145	Not to Exceed Gmax -40
145 to 180	Not to Exceed Gmax -26

Proposed ATC Base Station Antenna Discrimination Limits

Angle from Direction of Maximum Gain, in Vertical Plane, Above Antenna (Degrees)	Antenna Discrimination Pattern (dB)
0	Gmax
5	Not to Exceed Gmax – 5
10	Not to Exceed Gmax -19
15 to 55	Not to Exceed Gmax -27
55 to 145	Not to Exceed Gmax -30
145 to 180	Not to Exceed Gmax -26